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THE SYSTEMATIC USE OF ANTISEPTICS IN MIDWIFERY PRACTICE.

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THE SYSTEMATIC USE OF ANTISEPTICS IN MIDWIFERY PRACTICE.

THE prevention of deaths during childbed is a subject which can never cease to be of interest to this Society so long as maternal deaths continue in their present ratio to be, as they are, the reproach of our art. Attempts more or less successful to prevent them by means of antiseptics are not new. Already the literature on antiseptics in midwifery, although not so bulky as in surgery, is yet by no means inconsiderable. Antiseptics and disinfectants have long been employed in obstetric practice; but of recent years, since the introduction of antiseptics by Mr Lister into surgical practice, much greater attention has been paid to their systematic use in our department. In Copenhagen, Germany, in Switzerland, especially Basel, in Paris, in London, antiseptic precautions have been employed to ward off what is the scourge of our lying-in hospitals.

It is at least twelve years since Bischoff, impressed with a visit he paid to Mr Lister in Glasgow, returned to Basel and set himself to carry out antiseptics in the lying-in hospital there with the most gratifying results.

Although, therefore, antiseptics are by no means new in midwifery, yet there seem to me to be reasons which justify my bringing the subject under your consideration—

1*st*, Because of the prevalence in our Maternity Hospital of maternal deaths, which it ought to be the first duty of every obstetrician to diminish, if not to prevent.

2*nd*, Because I have had a fair opportunity of carrying out antiseptics with care and accuracy for at least two terms of my service there.

3*rd*, Because, so far as I know, the subject has not been ventilated here.

Now, concerning the question of maternal deaths, it must be admitted that the diminution of maternal mortality is the main object of our art. These maternal deaths, or deaths during childbed,—by which is meant deaths occurring within four weeks after

delivery,—have been shown by Duncan, M'Clintock, Le Fort, and others, to be striking in their frequency; Duncan finding the proportion 1 in 120, M'Clintock 1 in 128.

In our own hospital I have gone over the books from its foundation up to the present time, and I find that out of a total of 10,043 women who have been delivered in it, 1·84 per cent., almost 2 per cent., or nearly 1 in 50, have died, so that the Edinburgh Maternity shows a death-rate sufficiently high to attract our attention and incite to the adoption of all means in any way calculated to diminish it. There is, perhaps, a sort of melancholy satisfaction to be derived from a consideration of the fact that we have not as yet reached a mortality to be compared with that attained by some of the German and French hospitals, where a mortality of 1 in 11 is by no means uncommon.

One cannot help feeling inclined to echo Miss Nightingale's remark, who, in commenting on Dr M'Clintock's observations concerning what he thought to be the normal death-rate of childbed, 1 in 128, observes: "One feels disposed to ask whether it can be true that in the hands of educated accoucheurs the inevitable fate of women undergoing, not a diseased, but an entirely natural condition at home, is that one out of 128 must die. If the facts are correct, one cannot help feeling that they present a very strong *prima facie* case for inquiry, with the view of devising a remedy for the present state of things." And if a mortality of 1 in 128 justifies such a remark, how much more a death-rate of 1 in 50.

Now, maternal deaths may conveniently be classified under three heads:—

1*st*, Non-puerperal deaths—deaths occurring from conditions altogether apart from the puerperal state—deaths which possibly the puerperal condition may have accelerated, but which are not necessarily connected with it; *i.e.*,—deaths from phthisis, bronchitis, etc. With the occurrence or prevention of such deaths the present communication does not deal, but it may be interesting, in passing, just to note the relation which these deaths bear to puerperal deaths properly so called.

This has been well brought out in a table given by Munro in his excellent work on deaths during childbed. In this table he gives the deaths of women in England referred to childbed during the only fourteen years during which there is a record of non-puerperal deaths. He shows that out of 11,298,433 births of children born alive, 10,769 women have died from causes referable to this head,—in other words, that one-sixth of the women who die during the four weeks immediately subsequent to delivery succumb to diseases which are not the result of childbed. With the prevention of such deaths the physician *qua* accoucheur has but little to do.

The second class of deaths, termed the accidents of childbirth, are, of all the causes of death during childbed, those which are

most dependent on the skill and adroitness of the accoucheur. Such deaths may arise from convulsions, rupture of uterus, hæmorrhage, and so on. With these deaths we have not at present to deal.

It is with the third class of deaths, deaths from metria or puerperal fever, that we are now concerned.

Again let us look at Munro's table, where we find that of 66,792 women dying during the first four weeks after childbed, 22,355, or 1 in 3, died from puerperal fever.

I have shown the general death-rate of the Edinburgh Lying-in Hospital, but I am unable to say with any accuracy what the relative death-rate is, arranged under the three headings to which I have just referred. The reason of this is simply owing to a want of definiteness in the manner in which the records have been kept.

If the general death-rate is high,—and I fear there is no denying the fact,—much may be said by way of explaining and accounting for it by a reference to the various unsuitable and unsanitary localities in which it has from time to time been situate in its long though chequered existence. It is sufficient for my present purpose to analyze the death-rate since the opening of the New Royal Maternity and Simpson Memorial Hospital. Thanks to the admirable suggestion of Dr Keiller, accurate reports by the ordinary acting physicians have been published quarterly, and the death-rate, as well as the cause, can be ascertained with exactitude.

The new hospital was opened in May 1879, and from that date till the end of October 1880, 320 women have been delivered in the building; and of these 320 women 12 have died, making the mortality 1 in 26·6—3·89 per cent.—a sufficiently startling fact. In the new hospital no similar explanation of the high death-rate is to found. Here we have a completely new building, with all the most modern sanitary improvements, examined by the most competent sanitary authorities, and conducted with all due care and caution, with a death-rate accompanying a normal process I think I may say higher than now after the capital operation of ovariotomy in the hands of Dr Keith.

Let us analyze this mortality under the three heads to which I have alluded, viz., non-puerperal, accidental, and metria; and what do we find? From non-puerperal causes only one woman died, and she succumbed to an affection of the kidney. Under the second head it may be said that a maternity charity should, *prima facie*, be expected to have a higher death rate than extern practice, because to it are sent many serious operative cases. I do not think this is the case to the extent that might be supposed. Speaking of my own experience of our own hospital, the great majority of cases are not sent, but come voluntarily, not because of any peculiarity in their case, but simply for shelter till the confinement is over. No doubt serious operative cases are occasionally sent to hospital, but not in anything like the proportion that might

be expected. From this second set of causes there died but one patient, owing to an ovarian tumour complicating pregnancy.

We come now to the third class—deaths from metria or puerperal fever. Since the opening of the hospital, of the 12 deaths which have been recorded, 10 have taken place from this cause. Nor have these deaths been confined to the service of any one physician. With the exception of Professor Simpson, each of us has contributed his quota of deaths from metria. The occurrence of puerperal deaths to the extent I have just shown, occurring in a new hospital, is sufficiently striking to require our earnest attention. In a report which I read to this Society, giving an account of my first quarter at this hospital, I fully recorded three deaths from puerperal fever, and advanced what I believed to have been the origin of the disease, viz., the want of a separate mortuary, and the performance of *post-mortem* examinations in the hospital. Since that report this fault has been remedied, and the hospital thoroughly and repeatedly disinfected. Notwithstanding all this, the deaths from puerperal fever have continued. Yet during that period there has not been recorded a single case of death from a similar cause in the extern practice of the charity, although the births are double, amounting to 625, and the general death-rate only 1 in 156.

This brings us back to the old question long ago worked out by Sir J. Simpson, Evory Kennedy, and others, of home *versus* hospital practice, and of the greatly increased mortality of hospital as compared with home. The present communication obviously does not embrace any reference to the necessity of maternity hospitals, nor to the best methods of their construction. Those who wish a *résumé* of the whole subject will find such in Dr Munro's excellent book. To me it seems sufficiently established that maternity hospitals must exist, as much for the benefit of women at a time when they most need shelter and assistance, as for the clinical instruction which the medical student can receive there, and there only.

Another point seems equally clear to me, viz., that we must make the best possible use of the hospital we at present possess. For as it has already taken about half a century to impress upon the people of Edinburgh the need of a proper building to be used as a lying-in house, there does not seem any immediate prospect of another being built, even if any flaw could be pointed out as existing in the present one.

The present Maternity Hospital being a necessity, and puerperal fever having been shown to exist there, and to have been the direct cause of death in 1 out of every 32 women, and as all needful sanitary improvements have been made, it becomes necessary to look for the prevention of this scourge by means apart from the building itself.

I speak of prevention rather than cure, because I take it that it must be the experience of most if not all of us who have had to

deal with a pronounced case of puerperal fever, that in its presence we are nearly powerless, or at least we are not in a position to rely with certainty on the efficacy of any of the means employed. The recent paper of Dr Matthews Duncan on the treatment gives an account of the various means that have been employed, and it would appear that the pharmacopœia has been ransacked, and drugs of all kinds have been had recourse to, but with very uncertain effect. At most, we are fortunate if we alleviate pain by narcotics, or prolong life for but a brief period by a free administration of alcohol. If, therefore, we are comparatively unable to cope with puerperal fever once it is fairly established, it becomes our duty to be all the more anxious to adopt any precautions which may offer a reasonable hope of preventing it.

What, then, is the nature of this disease which has proved fatal in our new hospital to 1 out of every 32 women who have been delivered there? and is it feasible to suppose that it can be prevented? Now, I do not believe that we can ever hope to prevent puerperal fever entirely, because its origin is possible in so many ways, and the factors in its production are often beyond our control; but I feel certain that by a strict attention to antiseptics we shall be able to reduce its occurrence to a minimum, and render its presence in hospital practice, where I have just said it is most common, a rarity. By an almost general consensus of opinion, puerperal fever is regarded as a wound disease resulting from a poison introduced into the wound. Of wounds in the puerperal condition there is no lack, and that after the most normal labours.

Be the labour ever so natural, several wounds are never wanting —1*st*, A tear at the posterior commissure, and frequently, though they are often unobserved, tears in front, in the neighbourhood of the urethra and clitoris. 2*nd*, There is seldom wanting a tear in the cervix, more or less deep; and lastly, a wound at the placental site there always is. If there be any want of harmony in the three factors of labour, the wounds at the perinæum and cervix become more extensive, and there is superadded, possibly, the crushing and bruising of the parts from a prolongation of the labour as well as the application of instruments. Now, these wounds, as long as they remain open wounds, and until they become granulating sores, are liable to infection. Besides, these wounds are specially liable to absorb and rapidly spread noxious material through the system; for we must recollect the extreme vascularity of the genital organs and the parts in the neighbourhood, the expansion of the venous and lymph channels, as well as the diminished vitality of the parts close to the wounds.

Now, I have referred to these wounds probably in the order in which the infection takes place; because, no doubt, the external wounds are the most likely and most frequent conductors of infection. Next in order comes the cervical tear, and, least frequently, the placental site. Contained as it is deeply in the uterine cavity,

it is cut off from external influences by the contractions of the uterus. Now, we can only to a very limited extent indeed prevent these wounds. Of the conditions favouring the development and spread of infection in puerperal women by the vascularity of canals, the presence of open wounds, and the greater or lesser destruction of the vitality of the parts surrounding, we can only to a very limited extent indeed modify the two latter, *i.e.*, by a timely use of the forceps we may possibly prevent a deep tear, and certainly will prevent continued contusion, and, consequently, impaired vitality. So much for the condition of the parts favouring the absorption of septic material. Whence comes the infection? For sources of infection we have not far to look. These may either be from without or from within—autogenetic or heterogenetic. Of the former we can readily observe several sources. Even the normal lochia have been shown to be of importance, containing, as they do, copious debris; and if the normal lochia are to be considered possible sources of infection, what shall be said about this discharge when it has become fœtid? Decomposing blood-clot, as well as pieces of retained placenta and membrane, are by no means uncommon accidents during the puerperium. Then, again, the liquor amnii may become septic from contamination with external air in cases of early rupture of the membranes. The discharge from any of these sources, passing over the wounds to which I have referred, before they have become coated with granulations, may at once become a source of infection. To the heterogenetic there is scarcely a limit. First, there are the fingers of the accoucheur and the nurse, as well as unclean instruments and appliances. In our own Maternity, where both the University and extra-mural students are taught, there is the additional risk from students who, in spite of instructions to the contrary, may have come from *post-mortem* or dissecting-rooms, and from attending infectious cases. Further, there is possibility of infection from insufficiently cleansed linen, as was shown to be the case in a recent report of an outbreak of puerperal fever in the Queen Charlotte Lying-in Hospital in London. The medical report of this hospital for the past year shows that in the spring of the year 1879 sixteen deaths occurred from diseases comprised under the name puerperal fever—a fatality which very properly led to the temporary closing of the hospital and a careful inquiry into the cause of the mortality. The result of the inquiry was, as I have just shown, the discovery that the *fons et origo mali* lay in imperfectly cleansed linen. This hospital was closed accordingly, and since its re-opening the death-rate has fallen to 1 in 350. It need scarcely be pointed out that the presence of any decaying animal matter is sufficient cause of infection, as well as the proximity of fever or erysipelas. But, apart from these, the mere aggregation of lying-in women is of itself a cause of danger.

Such is the disease, and such the channels and source of infection. The channels of infection must remain. They are in great

measure a part, and a non-preventable part, of the normal process of delivery. The sources of infection, no doubt, are to a much greater extent under our control. By strict attention to cleanliness an immense amount by way of prevention may be accomplished; but in our hospital every attempt has been made. The hospital has been cleaned and disinfected again and again; one set of wards have been changed for another; and yet the mortality has gone on. Unlike some maternities, our hospital is not attached to any general hospital, so that one fertile source of infection is removed. The remedy, then, as Bischoff showed twelve years ago, consists in preventing the septic germs or bacteria from entering the wounds; and as carbolic acid is destructive to the vitality of these germs, the obvious indication is the employment of this or some other antiseptic systematically in the treatment of all cases of labour.

Now, although I would strongly advocate the employment of antiseptic precautions regularly in private practice, yet it is more particularly to the Maternity Hospital that the following simple antiseptic rules apply.

It is impossible, we must admit, to carry out antiseptics completely and thoroughly in obstetrics, at least, except by the adoption of elaborate contrivances, which I fear would be impracticable. But although absolute asepticism is not attainable, yet by a strict adherence to the rules we shall, by modifying the poison, either render it inert or else greatly diminish the severity of the infection.

Rules to be observed by Students.

1. No student shall be allowed to visit the hospital who is engaged in the dissecting-rooms, or in attending post-mortem examinations or infectious cases, either in hospital or dispensary practice.

2. No student shall examine any patient in the hospital, in any way whatever, except in the presence of the ordinary physician or the resident medical officers.

3. Before each per vaginam examination the student shall thoroughly wash his hands in carbolic wash (1 in 30).

4. In all vaginal or uterine examinations 1 in 20 carbolic oil shall be used for lubricating the fingers.

5. Each student, on entering the hospital daily, shall sign the album.

Rules to be strictly observed by Nurses.

1. *Washing Hands.*—No nurse shall touch, or make any application whatever, to the genital organs of a patient, without having first thoroughly rinsed the hands in carbolic wash (1 in 30).

2. A large bottle, containing a solution of 1 in 30 carbolic acid, and a small bottle of carbolic oil (1 in 20), shall permanently stand on the table in every ward and delivery-room.

3. *Diapers.*—Each diaper, on removal from a patient, shall at

once be taken out of the ward or delivery-room downstairs to the wash-house, and then placed in a tub containing carbolic wash.

4. Each diaper shall be washed, boiled, and dried by the laundress.

5. Immediately before application to the patient's genitals, the nurse in charge of the case shall soak the diaper in 1 in 20 carbolic wash, and afterwards dry it, or apply it wet, according to instructions.

6. *Catheters, Vaginal Tubes.*—All catheters and vaginal tubes shall be kept, when not in use, in carbolic oil (1 in 60).

7. *Before* using a catheter, the nurse shall dip her fingers and catheter in carbolic oil (1 in 20).

8. *After* use she shall wash the catheter in carbolic lotion (1 in 20), and then replace it in carbolic oil (1 in 60).

9. *Syringes, Sponges.*—All syringes and sponges, when not in use, shall be kept in carbolic wash (1 in 30).

10. Before using a syringe, the nurse shall lubricate her fingers and the vaginal tube of the syringe with carbolic oil (1 in 20), and see that the air is carefully expelled.

11. *Washing and Syringing.*—All washings and syringings, when such are required, shall be done with a solution of carbolic acid (1 in 60).

12. All the Mackintosh sheets shall be thoroughly washed in carbolic wash.

13. *Dirty Sheets.*—All dirty sheets shall be promptly removed from the ward or delivery-room to be cleansed.

14. *Deaths.*—On the death of any patient, the body shall at once be removed to the mortuary outside the hospital.

15. *Visitors.*—No visitor whatever shall be allowed admittance to the hospital unless provided with a special pass from the resident medical officer on duty.

In respect of these rules there are one or two points which require special notice:—

1*st*, In regard to the application of diapers. In the hospital it has been the custom to use the same diapers over and over again, which in itself I hold to be a source of danger; but further, if the nurses are allowed to apply the diapers dry there is no sufficient guarantee of when they have been dipped and dried. As the first twenty-four hours are the most dangerous period, the wounds being raw and the vagina more or less patent, I have adopted the precaution of having the diapers applied when still wet with carbolic wash during that period. This precaution I hold to be of great importance. Perhaps diapers dipped in boracic acid and allowed to dry might do equally well, if not better. They would be applied with crystals still adhering to them, and would probably be more comfortable for the patient.

2*nd*, All operative procedure, such as application of forceps and the introduction of entire hand into vagina or uterus, I have con-

ducted under the carbolic spray, with the instrument and arm well lubricated with carbolic oil. The latter is absolutely essential under all circumstances. The former—viz., the use of the spray—is, I think, needful only in hospital, where the chance of infection is greater than in home practice, and also because in hospital, at least in teaching hospitals, the measure, to be properly demonstrated, requires longer time and more exposure of the parts. At the same time, if I had to deliver a woman in private with scarlet fever or erysipelas in the house, I should certainly use the spray.

3rd, The carbolic oil is to be preferred to carbolic acid wash to keep the instruments when not in use. I fear I have destroyed several catheters and vaginal tubes with the carbolic wash. A weak carbolic oil does not in any way injure gum-elastic instruments.

4th, I have adopted, and found it valuable, to insist on the students, at every morning visit, signing an album acknowledging that they have conformed to the rules I have laid down for them.

5th, In any case where the labour is prolonged, it is desirable to wash out the vagina occasionally with a weak solution of carbolic lotion previous to delivery.

These rules, involving as they do considerable trouble on the part of the nurses, are apt to be perfunctorily carried out. A great deal of the success of the treatment, therefore, depends on the energy and strictness of the resident surgeons. It must be their duty, at each daily visit, to inquire carefully whether and how the antiseptic precautions have been carried out in the case of each individual patient. Satisfactory results cannot be expected unless the precautions are scrupulously observed in every case.

In bringing this Paper to a conclusion, the question naturally arises, Am I able to show that the adoption of these antiseptic precautions has been accompanied by any good results in my own experience during the two terms I have had the privilege of conducting in the present hospital? Early in my first quarter three maternal deaths from septicæmia rapidly succeeded one another, originating in the manner I have already described. During the same period high temperatures and frequent attacks of pelvic peritonitis were common.

After the third death the antiseptic precautions just described were adopted, with the result that the temperature became normal, the peritonitis disappeared, and no further case of septicæmia occurred. On assuming duty this quarter I found a septic case in hospital, which died from septicæmia, and shortly after a second patient succumbed to the same disease. Thereafter antiseptic precautions were energetically carried out, and no further case occurred, and the temperature, with one or two exceptions, to which I have alluded in my report, became and continued normal; for I hold that the frequent pelvic disturbance and high temperature which showed themselves in the early days both of my present and former quarters were owing to septic influences, these becoming definitely and

fatally developed when specially predisposed persons were attacked. But it may be said that the satisfactory result in my first quarter was owing to the closure of the hospital, and its thorough disinfection, and at that time such certainly was my impression, as shown in my previous report; but this year, after the second death from septicæmia, no such closure took place, and the deliveries went on uninterruptedly, the only change being the careful adoption of the antiseptic rules, and yet no indications of septicæmia manifested themselves. It must be kept in recollection that we labour in the Maternity under two great disadvantages—

1*st*, We have not, as in other hospitals, a permanent trained staff of nurses, but each acting physician has to begin and conduct his quarter with a new and often most incompetent set of women, who, without any previous instruction, come to be trained as nurses. It is often with difficulty we can impress on them the most ordinary rules of cleanliness, apart altogether from the carrying out of minute antiseptic details. It is therefore with satisfaction we must regard the proposed appointment of a permanent trained nurse, to whom the superintendence of such minutiæ can be left.

2*nd*, It must be borne in mind that the majority of the intern cases are single women who have been seduced, and who, apart from their mental condition, which is of great importance, have, previous to admission, been in straitened circumstances and badly nourished, and are consequently specially liable to be quickly and gravely affected by any septic influence under which they may be brought.

From these and such like causes I fear it is utopian to hope that we shall ever be able to prevent puerperal septicæmia entirely. I feel convinced, however, that by a strict observance of these or some such antiseptic rules we shall very materially diminish its frequency, certainly prevent anything like an epidemic, and render its presence a rarity in our hospital, where hitherto it has been a scourge.

ON A

COMPLICATION OF OCCIPITO-POSTERIOR POSITIONS OF THE VERTEX.

THOUGH much has been written on the subject, occipito-posterior positions of the vertex offer a wide field for study. The frequency of this deviation from the normal standard is sufficiently marked to warrant us in endeavouring to trace out every complication which may accompany the position. Without detaining you with statistics, I should like to draw attention to the fact that, out of 414 births which have taken place in the new Maternity Hospital since May 1879 up till the present time, 59 occipito-posterior have occurred, *i.e.*, 14 per cent., or 1 in 7. In the present communication I wish to limit myself entirely to an inquiry into one of the complications met with in this form of cranial position. It may be broadly stated that the complications of occipito-posterior position resolve themselves into two sets—1. Those met with in the first stage of labour; 2. Those met with in the second.

During the first stage of labour occipito-posterior positions are unquestionably a common cause of delay. This delay is, no doubt, frequently enough incorrectly referred to simple rigidity of the cervix. In some cases there may be rigidity as a complication; but where the parts preserve their normal tone and elasticity, and where the head and pelvis are of normal size, delay in dilatation of the cervix from the position of the head alone is by no means an uncommon occurrence. The explanation of this delay is not difficult to discover. If a digital examination be made early in the first stage of labour, the finger will recognise, not the posterior fontanelle, but the anterior extremity of the sagittal suture. In other words, from the obliquity of the uterus and the resistance of the tissues in the neck, the occiput is carried against the pelvic wall of the uterus and the sacral promontory, and a certain degree of extension is the result.

Now, it seems that this degree of extension, this difficulty in completing flexion and of driving the flexed head into the pelvis and bringing it to impinge on the os uteri—constitutes the main difficulty in occipito-posterior positions all through labour. For

the same reason the cervix suffers to a greater extent in occipito-posterior than occipito-anterior positions, the dilatation required in the one case being greater than in the other.

Meigs says, "When the vertex is to the front it enters the os uteri favourably, and passes through the orifice with a circumference of $10\frac{1}{2}$ inches, or a circle of $3\frac{1}{2}$ inches diameter; but when in a posterior direction, the latter acquires a circumference of $12\frac{1}{2}$ or 13 inches.

A further complication is met with in the second stage when the resistance of the pelvic floor is encountered and rotation takes place. With any of the three possibilities of rotation there is delay. 1. *If forward*, there is double the distance to travel to that demanded in a first or second position. 2. *If backward*, the uterine force drives the head against the floor of the pelvis. The result is, instead of the head being pushed up from the floor of the pelvis and escaping under the pubic arch, it rolls back into hollow of sacrum under the sacral promontory. Here again the essential thing to do is to obtain flexion. It is no part of my present object to discuss the important practical question which here arises, whether we can hope for a change spontaneously or by art. The main point is to secure flexion. But a *third* possibility may occur, again, as a result of want of flexion, that is, when the pelvic resistance behind prevents descent and flexion, and when the head becomes jammed more or less transversely. It is to the result of the third possibility that the present communication has reference. Beyond the complications to which reference has been made, the increased laceration of the perinæum in these cases where the head is delivered persistently posterior, whether spontaneously or by artificial aid, must not fail to be mentioned.

The following cases are illustrative of the third variety of occipito-posterior, viz., those in which neither the anterior nor posterior rotations take place spontaneously, but where the head remains jammed between the lateral pelvic walls, and where, as a result, there is more or less extensive injury to the soft parts in the pelvis, this injury being uniform in its location and nature.

I. The first time the condition was brought under my notice was on beginning duty at the Maternity Hospital in August 1879.

It has been my habit ever since my appointment to the Maternity Hospital to examine each patient per vaginam on the tenth day post-partum. I am aware that objections have been raised to such a procedure. This is not a fitting opportunity to discuss these. I will only say that I have derived much valuable information from such examination. In many cases I believe I have been able to give useful advice to the patient, and certainly in no case am I aware of having caused the patient temporary suffering or permanent injury. Carried out with ordinary antiseptic care, with gentleness, and with a due regard to the patient's feelings, I am unable to appreciate the objections that have been raised. On the con-

trary, I would strongly advocate a similar careful examination of each patient some weeks before delivery. Many complications might be foreseen, and accidents avoided.

The first post-partum examination I made on assuming duty in the Hospital in August was on a patient who had been left over from the previous quarter. The report by Drs Murray and Adam is as follows:—

6th August.—Perinæum torn down to within half an inch of anus. On the right side of the pelvic wall, in the region of the right ischial spine, there is a distinct opening. Its edges are smooth and incurved. It admits readily two fingers, is about an inch in length, and its direction, as ascertained by a probe, is downwards and backwards. Through the opening the ischial spine can be felt.

Left side normal.

Cervix forms but a slight projection; its edges are ragged and tender. It is bilaterally fissured, more deeply on the right side.

Uterus normally situated.

The examination causes no pain, except when the edges of the sinus are touched, when the patient cries out.

The previous history:—Patient, a multipara in her fifth confinement, each a forceps case, was delivered on the 28th July. The presentation was vertex, and the position right occipito-posterior.

The first stage was completed in five hours; second stage, three hours. Owing to the delay, forceps were applied, and the fœtus delivered with backward rotation of the occiput. On the patient's dismissal from hospital three weeks after delivery, the sinus was still open, and admitted a probe at least $\frac{3}{4}$ of an inch.

Case II.—In private practice, a primipara, æt. 21. Labour began at midnight. At 8 A.M. I found the os well dilated. Head R.O.P. At 9 the membranes ruptured. At 9.30 the head had cleared the os, was descending R.O.P., with extension marked. The pelvis was deep. At 1 P.M., as no progress was made, a careful examination was made by Dr George Mackay and myself. We found head extended, the occiput lying just over the right iliac spine, in front of the oblique diameter.

Forceps were applied, and delivery easily effected. There was no attempt to rectify the position, but simple traction was made, resulting in the forehead coming under the arch of the pubes, and the occiput sweeping over the sacrum and perinæum. There was a considerable tear of the perinæum. The patient, it is to be observed, was in the second stage from 10 till 1, a period of three hours. The perinæum was stitched.

The patient required to have her urine drawn off for three days. She completed her puerperium without any pelvic pain, but with a slight rise of temperature. On the 10th day the stitches were taken out, and a per vaginam examination. Perinæum com-

pletely healed. On the right vaginal wall there is a deep sinus. The edges are smooth and bevelled. The wound easily admits the tip of the forefinger, and is not tender. On introducing a probe it is found to pass in one inch, direction downwards and backwards. Through the wound the ischial spine can be distinctly recognised. Muco-purulent discharge is profuse. At the end of six weeks:—The wound is felt almost closed. There is still a deep furrow. I had occasion to make an examination of the patient a year afterwards, and found the cicatrix well marked.

Case III.—An extern hospital case, seen with Dr Maculloch, resident physician, Royal Maternity. The patient, a young Irish woman, a primipara, had been in labour for fifteen hours, ten in the first stage, and five in the second. The pains were strong, and the head right occipito-posterior, but tending to transverse. I applied forceps, and delivered easily, not, however, without a considerable tear of the perinæum. There was backward rotation of the occiput. The pelvis was a deep one. The perinæal tear was immediately stitched.

The puerperium was uncomplicated. On 10th I removed the stitches, and found the following condition:—Perinæum healed. On the right pelvic wall there is a distinct laceration over the sacro-sciatic lig. and the ischial spine, admitting easily two fingers. The edges are smooth, but tender; a probe enters readily $2\frac{1}{2}$ inches upwards. There is a considerable muco-purulent discharge; cervix deeply torn on the right side. Uterus normal. With the further history of the case I am unacquainted.

Case IV.—Private practice. A lady who had previously been delivered of her first child by a friend in the country, was recommended to me by him for attendance during her second confinement. Her first delivery was aided by forceps, owing to the backward position of occiput. I have no other particulars concerning it. Her second labour occurred on 10th December 1879, when I saw her at 10 A.M., she having been in labour since 10 the previous night. I found the head had passed beyond the cervix and was right occipito-posterior, the posterior part of head lying over the right ischial spine. The outlet seemed small, and the pelvis deep. At 12 noon, as no progress was made, I applied forceps and delivered a persistent occipito-posterior head. The perinæum, which had been considerably torn in her first labour, was not further injured.

On the third day she had difficulty in passing water, and on the fourth I had to draw it off with a catheter. This I had to do for several days. As I was anxious to know the cause of the retention, I made a vaginal examination, and found:—An old tear of the perinæum. On the right pelvic wall there is a deep laceration easily admitting two fingers; its direction is down and back; very tender; left side normal. Cervix deeply torn on the right side. The edge of the cervical tear is flush with the roof of the vagina.

There was no constitutional disturbance worthy of note. The vagina was well washed out twice daily with an antiseptic lotion. At the end of six weeks the wound was rapidly closing, but it was three months before it absolutely healed.

Her next confinement took place in December 1880. When I reached the patient the head was well down in the pelvis, close to the vulva. The patient, who had always been averse to the attendance of a doctor, only allowed the nurse to send for me after she had been in labour ten hours, when she was worn out and desirous of having chloroform administered. I administered chloroform; and as the head was small and well down on the perinæum, I allowed nature to complete the case. The head was born with the occiput backwards half an hour after my arrival.

On the third day post-partum she again complained of retention of urine. Before using the catheter I insisted on a vaginal examination, which was submitted to with reluctance. I found the perinæum without any fresh tear. On the right pelvic wall I found a distinct solution of continuity sufficient to admit easily the tip of my forefinger. Its location was just over the site of the previous injury. The cervix was bilaterally fissured, the right side being the deeper; otherwise the parts were normal. Before leaving the patient at the month's end I was allowed an examination, when I found the sinus healing, but not closed.

The records of these cases show a marked similarity. In each there is a special cranial position, and a special pelvic lesion along with it.

Judging from the foregoing cases, given a right occipito-posterior position of the vertex, delayed in its rotation at a particular point in the pelvis, a more or less deep injury to the soft parts, resulting in a sinus, is likely to occur. Injuries and lacerations of vagina are common enough in labour with a contracted pelvis. Schroeder has drawn attention to this.

Dr Angus Macdonald,[1] in an instructive paper on occipito-posterior positions, makes a short reference to laceration of the soft parts. He writes as follows:—"Of those which terminated face to pubes, four of the mothers were primiparæ, and two multiparæ." In those six cases which ended as "face to pubes," in *one* case only, and that, too, a multipara, did there occur anything other than the most trifling laceration of the soft parts. In this case the laceration, which was not at all severe, affected the back wall of vagina without affecting the perinæal tissues. It soon healed up, and gave no inconvenience.

Both Schroeder[2] and Macdonald refer to these lacerations, but give them no definite location in the pelvic cavity. They both further refer them to the use of the forceps.

1 *Transactions of Edinburgh Obstetrical Society*, vol. iii. p. 361.
2 *A Manual of Midwifery*, p. 305.

Let us now proceed to examine the vaginal lesion as met with in the cases recorded, as well as its causation.

1. *Its Position* on the right side of the pelvis, on a level with and including the right ischial spine. On passing the finger into the opening the spine can readily be felt.

2. *Its Extent and Direction.*—In the recorded cases the sinus was from one to three inches in length, and its direction in three downwards and backwards, and in one upwards.

3. *Its Causation.*—The head descends slowly, slightly extended in the left oblique diameter, until it reaches the floor of the pelvis. Here the elastic resilient posterior wall of the pelvis, aided by the forward and downward inclination of the ischium, attempt to throw the head forwards. If the pelvis be normal, and the head of average size, this is actually what takes place in the vast majority of occipito-posterior positions. If, however, the ischial planes are nearly parallel, that is, if the normal slope is diminished, and if the ischial spines be prominent, as in the masculine or deep pelvis, then the advantage and cause of cavity rotation are lost. The head descends in the oblique diameter, the usual forward rotation is attempted, but the head becomes jammed over the ischial spine. The head, somewhat extended, becomes fixed, and the pressure so caused results in a slough which involves the right ischial spine. This mechanism somewhat resembles that met with in a rickety pelvis. If rickety mechanism consists in transverse descent and extension of the head, then to a certain modified extent that is what we meet with here; the depth and extent of the slough and sinus bearing a distinct reference to the length of time the head has remained fixed. It is clear, however, that but a short delay of the head in this particular position will cause a vaginal sinus of very considerable dimensions. This is well brought out in Case II., where, in a primipara in whom the second stage was scarcely three hours, a sinus of two inches in length resulted. Now, these sinuses in this particular position are deeper and more marked than one would expect from the narrowness of the pelvis and the length of the pressure. This admits of explanation in the fact that the sharp prominence of the ischial spines afford a point upon which the great bulk of the expulsive force can be readily expended. It can hardly be matter for doubt that the majority, if not all of the cases of persistent occipito-posterior occur in more or less deformed pelvis. The mere fact of their repeated recurrence in the same patient is of itself a strong proof of this. The invariable occurrence of the lesion over the right ischium is a point to be noted. In looking for an explanation of this several points are to be noted:—

1. Right occipito-posterior positions are more common than left.

2. The occiput bearing on the right ischial spine excites a greater pressure than the sinciput bearing on the left.

1*st*, Because the occiput is *at first* more prominent than the

sinciput. I say at first, because—thanks to the valuable observation of Dr Hart[1]—the compression which the head undergoes in this position is such that the head is pressed on in its antero-posterior diameter, and thus the asymmetrical wedge shape of the head is obliterated, so that at the point of contact with the pelvis neither end of the head has an advantage over the other, both being equally steep.

2*d*, Because the pressure of the posterior pelvic wall will act more on the occiput than the sinciput, thus tending to drive the occiput forward.

3*rd*, Because the occipital arm is the shorter of the cephalic lever, and the pressure bears more directly on the force resisting it than on the force resisting the longer arm. Although, in this Society, the lever theory, as accounting for flexion of the fœtal head, has been ably combated by Professor Simpson,[2] yet the lesion we have described would seem to negative the condition assumed by Lahs[3] in his conception of the mutual relations of the girdle of contact and the fœtal head.

Results.—It must be admitted that in none of the cases I have recorded were the results to the patient serious, so far as the ultimate issue was concerned. It is none the less true that such lesions may easily become of grave import.

1. In two cases the patient suffered from retention of urine, requiring the use of the catheter. This was no doubt due to the vaginal wound, in the same way that retention is observed resulting from perinæal tears.

2. The constitutional disturbance was small, and pelvic pain not in any way marked—so much so that, on that account, such injuries are very apt to be overlooked. This is what might be expected in a localized parametritis.

3. Such lesions greatly increase the risks of septicæmia.

4. They may be the starting-point of serious and long-continued parametritis.

Two further points require notice :—

1. Did the forceps cause the injury? I think not. The history of Case IV., at all events, conclusively proves that such an injury may occur without any instrumental interference; on the contrary, I believe—

2. That the prevention of the injury is to be looked for in the early application of the forceps. If my explanation of the occurrence of this lesion is correct, then it is clearly bad practice to delay applying forceps to a partially rotated occipito-posterior head.

Why are these sinuses not recognised? *a.* Although, after a forceps case, every careful practitioner will examine the vagina,

1 *Transactions of Edinburgh Obstetrical Society*, vol. v. part 2, p. 131.
2 *Transactions of Edinburgh Obstetrical Society*, vol. v. p. 75.
3 *Die Theorie der Geburt*, Bonn, 1877.

yet he will probably fail to detect the lesion, as the opening, if there is one at all, will be very small, the injury being the result of pressure, and the slough not separating for some days. *b.* Because such injuries cause but little pelvic disturbance, and the attention of the accoucheur is not attracted to the pelvis, and no vaginal examination being made, the injury remains unobserved.

To sum up—

1. A partially rotated occipito-posterior position is the least common of the various forms of occipito-posterior position.

2. Such an occipito-posterior position is usually associated with a degree of minor disproportion of the pelvis.

3. A very frequent if not invariable result is the formation of a more or less deep vaginal sinus.

4. The situation of this sinus is over the right ischial spine.

5. The extent and depth of the sinus depends on the length of time that the pressure has been exerted; though a very short period of pressure is sufficient to cause a sinus.

6. These sinuses do not cause very much constitutional disturbance, and their existence is often overlooked, because no vaginal examination is made.

7. The prevention of such injuries is to be found in an early use of the forceps.